

FAQs on Future-Proofing

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* Obviously there are deep similarities between the concepts of "future-proofing" and "resilience." Why might "future-proofing" be the preferable term? Is "sustainability" itself becoming an obsolete term?

- First, we need to understand the definitions of resilience and future-proofing. Resilience is that can withstand external shocks to a system. Future-proofing the process of anticipating the future and developing methods of minimizing the negative effects and taking advantage of the positive effects of shocks and stresses due to future events.
- Sustainability is still a valuable term and concept, though waning in popularity. I believe it is coming to be understood as a very important aspect of resiliency and future-proofing.
- Resilience is the trending term. There are several attributes to resiliency (see the resilient Design Institute website), so it is not always clear in what sense something is being described as resilient.
- Future-proofing is understood to be very similar to resiliency. I selected this term because I wanted to make the point that there is potentially a wider definition of resiliency which can be understood and that it varies depending on the subject under discussion.
- There has been some resistance to the use of the term future-proofing by some people because of the negative implications of the term. Think of bullets and bullet-proof. Bullets are typically thought of negatively. Similarly, the future can be thought of as negative as well. However, the future can also be very positive and the built environment can and will find ways to take advantage of the many different types of shocks and stresses that are ahead of us.
- Potential additional attributes of future-proofing that did not make my initial list of 10 Principles include: Maintenance – a building must be properly maintained to stay in good shape for the long haul. Deferred maintenance is the enemy of future-proofing and resilience.

* Preserving and rehabilitating existing buildings is already a "hard sell" in certain quarters, given that a strong percentage of builders/clients still believe that new construction is better (and can be more energy efficient). How can the concept of future-proofing be marketed to building and design professionals and to clients?

- Long term environmental impacts – A 200 year life cycle analysis study I completed in my research suggests wood is the best building material in terms of environmental impacts – but biogenic carbon is eventually released back into the atmosphere and killing trees for wood reduces the ability of the planet to counter the human production of carbon dioxide.
- Economics of preservation have been proven over and over again in studies by Donovan Rypkema and the Preservation Green Lab, amongst others.
- Property value increases have also been proven in multiple studies of historic districts
- However, none of these are short term investments. These must be looked at in terms of long term return on investment – not the common 7 year commercial loan period.
- Energy conservation has been proven to be just as possible, if not more so, in well-built historic buildings. One need only look at the high LEED ratings achieved by historic buildings. The mass masonry buildings are excellent thermal energy sinks and help to stabilize indoor temperatures compared to variations in outdoor temperatures.

- Perhaps the most obvious way to sell a future-proof building is to look at durability, flexibility, and adaptability. It is often deterioration of a building that is most repugnant to any user. I have coined the phrase: “A building loved, is a building used, is a building lasting” to capture the effects of continued use of a building. One that is cared for and remains occupied and in use will last longest. This means that not only must the building be durable and adaptable to multiple uses over its life, our attitudes must also be adaptable and flexible to conceive of different ways to use a building or how to fit into it rather than how to make the building adapt to us. The time of the wasteful wild-west if-you-don’t-like-it-then-throw-it-away-and-get-something-new attitude that people in the US developed on the basis of perceived infinite resources of the New World has come to an end.
- Cult of repair – Check out the Repair Manifesto (<http://www.platform21.nl/download/4453>). This thinking is very future-proof thinking.
- Another challenge is the declining level of expertise and knowledge of craft in architecture. One fellow architect lamented to me that in the time of the Master Builder, all aspects of a building were lovingly carefully created. With mass production of materials today, craft has been lost, first by architects and more recently by contractors.

* In terms of durability, are current manufacturers providing adequately durable materials today to truly accomplish future-proofing, or does some reform have to happen in the manufacturing industries as well?

- I am not about to stand up and advocate for going back to the middle ages and using only stone for our buildings. However, there is clearly a dearth of durable building materials that are available at inexpensive prices that are highly durable. For example, wood quality has been steadily decreasing as more and more second growth material is used and designs are less and less thoughtful about how to protect materials that deteriorate easily. Simple concepts like roof overhangs are often not used anymore. Flat roofs have replaced steep slope roofs that use gravity and surface tension to help shed water.
- Design for disassembly and repair is also an important issue in this discussion. Some projects employ highly durable materials such as stone and brick and stainless steel, and then have gaps filled with sealant or thin sheet metal to protect the materials behind. In order to repair the sheet metal and wall behind when the sealant inevitably leaks, one must remove all of the durable materials. Materials on a building must be consistently high quality. A 50 year design should not combine brick and painted sheet metal. Brick and copper or stainless steel flashings are more appropriate. Also closely related to this is the concept of design for disassembly and repair. The designs should allow for ease of repairing deteriorated parts.
- Also related to this is the emphasis on getting what you want in a building by decreasing the cost per square foot as much as possible. This is where our attitudes about adjusting our thinking from programmatic “needs” to “wants” becomes important. Rather than sacrificing quality of construction, be more flexible in how the space is used and how much space one actually needs for each occupant. Micro apartments in New York are an example of well used space and adaptation by occupants to smaller spaces to live in.

* Should LEED or the Secretary of the Interior Standards be revised to incorporate more future-proofing concepts? What needs to happen for these standards to change?

- I recently completed research on the possibility of adopting the Principles of Future-Proofing for historic buildings into the Secretary's Standards and international preservation standards. What I found is that the Secretary's Standards are archaic and likely not able to keep up with the evolving understanding of heritage conservation. The key issue here is that because of the thousands of jurisdictions that have adopted the Secretary's Standards, the vast majority have only adopted the Rehabilitation Standards and have done so not by referencing them, but rather by writing them into the codes that are passed by local legislative bodies. This makes it nearly impossible to change them all.
- In addition, because jurisdictions in the US have only adopted the Rehabilitation Standards, we are stretching the applicability of the Rehabilitation Standards to many different types of cultural heritage which were never anticipated to be covered. The Standards were originally developed to evaluate rehabilitations of tax credit building projects pursuant to the National Historic Preservation Act of 1966. They were never meant to apply to sunken ships, train cars, cultural landscapes, and other artifacts that we might consider museum pieces. Yet, in the international preservation realm, dozens of standards have been developed to apply to specific situations and types of assets. Check out https://www.getty.edu/conservation/publications_resources/research_resources/charters.html Here you will find Charters and Documents addressing the specific needs of sunken ships, moveable cultural property, movies, gardens, landscapes and natural and man-made environments of specific regions and cultures.
- Indeed, my research was to show how the principles of future-proofing could be incorporated in either the US or international preservation systems. What I found was that in the US, the adoption of a paragraph capturing the Principles would work best and it could be adopted in the guidelines and operating procedures of landmark commissions easiest. It would be much harder to incorporate them into legislation because of the challenges of the political process. Another way to adapt them is to make a market for them such as LEED and the USGBC. However, the challenge in this technique is the time duration. It takes too long to see the results. By contrast, it is much easier to propose the principles of future-proofing as a new cultural heritage document, similar to the 1964 Venice Charter or the 1994 Nara Document on Authenticity which could then be applied by the parties to the World Heritage Convention.

* What would you like to see the architecture profession in general, and the AIA in particular, do with regard to institutionalizing "future-proofing" as a design goal?

- A significant emphasis in architectural practice and education has always been design. The realm of technical issues in design has fallen beneath the dominant desire for aesthetics. By this I mean that there ought to be a respected sub-discipline of architecture which carefully teaches the ins and outs of how a building is put together. This course of study should focus on the nature of building materials, their origins, strengths, weaknesses, modes of failure and deterioration, and their repair. It should focus on building pathology and forensic investigation of building failures to teach students what to look for and how to repair it rather than demolish it and build anew. This course of study should not be just one semester or quarter, but rather a specialty certificate program as part of an architecture degree similar to sustainable design.
- I have, to this end, refreshed the content of and proposed teaching a course at the University of Washington College of Built Environments which focuses on building materials. Initially this class was focused on preservation issues and buildings alone. However, these issues are widely applicable to all 4 departments at the UW (Architecture, Urban Design, Landscape, and Construction Management) and beyond and the course has been designed to be applicable to

all in the building trades. It is even thought that this course would be advertised to students in other departments such as material sciences, engineering, archaeology, and museology.

- Course work for interns and continuing education should also emphasize hands on work with tradesmen in craft schools and on site to demonstrate the issues involved with building materials.